NASA and the Apollo Program

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INTRODUCTION

This paper represents a first step, one of defining the overall organization of the manned space flight effort within NASA. As such it is oriented toward isolating gross and abstract concepts which hopefully will give direction to, and make more comprehensible, this immensely complex organization. Some words of caution, much of our interpretation is conjecture. This is partly due to the nature of the source material we have utilized which essentially deals with only the early years of NASA, and, the fact that most of the available published materials are only tangentially relevant to the organization and management of the Apollo program. Further, our research thus far has led us to documents which are primarily oriented toward top NASA management in Washington. There is the distinct possibility that these materials present a view of the NASA organization which is quite limited in perspective, a view which conceivably could be inflating the importance of the headquarter's component. The typical framework employed in the secondary source material encompasses the totality of the NASA organization and thus tends not to emphasize the ways in which the Apollo Program fits into the total NASA complex. In sum, secondary source material, while suggestive, has allowed us to take only the first faltering step toward the development of a comprehensive analytic model.

A major assumption we make about organizations is that they respresent partial solutions to problematic situations. With specific reference to the Apollo Program and NASA, we are saying that it was necessary to constantly revise and modify the organizational arrangements to accomplish

the objectives of the manned space flight effort and still have NASA
as an organization survive. This is so because the extant organization
at any one moment in time contains groups with specific situated interests,
some of which are congruent and some of which are antagonistic. Further,
the demands of the program changed through time, as did the nature of the
external environment within which the organization was located. As a
consequence, the Apollo organization conceptualized as a set of means
created to make possible a manned lunar landing changed to accommodate
the changing situational contingencies. The same is true for the NASA
organization as a whole, and therefore the character of the relationship
between NASA and the Apollo program organization changed as well.

A second assumption we make in this paper is that one must track the
NASA-Apollo configuration through time, isolating the varieties of differing
organizational arrangements that manifest themselves and more than this,
illuminate those salient delemmas which give rise to the observed success-
ive organizational perturbations. What we are implying here is that
one can only understand the functioning of the Apollo organization by
constantly assessing its fit with the larger NASA organization. We
are also implying that an historical perspective is necessary, particularly
because of the life-cycle character of the Apollo Program. Given the scope
and complexity of the Apollo Program, any one analysis can only help
to explicate the change process in gross terms utilizing successive
modifications and extensions of an inductively synthesized model as a
continuous guide in determining the essential facts and ideas.

The main body of the report deals with a series of organizational
changes that occurred in NASA from inception through 1967. The common

thread which ties them together is our tentative analysis which suggests
that the organizational change process in NASA is a consequence of the
dilemmas inherent in combining a permanent bureau organization characterized
by semi-autonomous technical research laboratories with a larger non-
permanent program organization characterized by highly coordinated "contract
monitoring" activities. Further, we believe that the problems were
exaccerbated by the fact that most of the men and dollars to maintain
the enterprise were given to the program organization. We are initially
asserting that the resulting tensions were resolved by successive changes
in organizational arrangements directed toward the establishment of a
permanent organization capable of being controlled by top management.
It is our contention that the major organizational changes that have occurred
in NASA were instituted to guarantee the survival of the organization
as a highly efficient and flexible set of arrangements which would serve
as a national technical resource base after the completion of the
Apollo Program. A resource base organized is such a manner as to be
capable of undertaking future space projects and programs and as well,
able to continue to provide technical support and advice in all phases
of aeronautical and astronautical activity.

The very nature of the Apollo Program also contributed to the successive
organizational changes. The dillemmas within the Apollo Program,
revolving around the issues of time constraints, cost, performance and
configuration, tended over time to bring about changes which resulted
in greater control vested in the top management group of the Apollo
program. Thus, both the problems attached to integrating the Apollo
program with the NASA organization and the problems inherent in

managing the Apollo program itself tended to be solved by greater control from the top, always constrained by the necessity of successfully completing the manned lunar program and the requirement to maintain the research laboratory capabilities.

Historical Notes and Reflections - NASA Organization

On October 4, 1957, the Soviet Union announced that it had successfully launched an earth satellite, Sputnik I, into orbit around the planet. A month later, the Soviet Union announced that it had launched another satellite which weighed 1,100 pounds and carried a dog. These events created an unprecedented public crisis in American society. The intense and widespread public reaction to the Russian achievements focused mainly on alledged discrepancies in science and weapons technology. Despite assurances from the President that Sputniks I and II did not represent a serious threat to the security of the United States, or an insurmountable lead in space sciences and rocketry, the presence of Russian satellites in orbit around the earth provided convincing evidence to many Americans that the Russians had made a significant scientific and military leap forward. Educators and scientists referred to Sputniks I and II as incontrovertable proof that scientific education in the Soviet Union was superior to that in the United States. Claims to the contrary were difficult to defend publically. Security minded citizens regarded Sputniks I and II as a first step toward Russian military dominance of space and proffered grim visions of weapons raining down on earth from space. Other groups exploited Sputniks I and II as an opportunity to criticize the general direction of the Eisenhower administration. Doubtless, this intense and widespread

reaction was inflamed by vivid and bitter memories of Berlin, Korea, the
McCarthy era and the invasion of Hungary. In short, a society which viewed
itself as the most affluent, technologically advanced, and military powerful
society in human history felt humiliated and intimidated.

Another dimension of the public reaction to Sputnik had to do with an
investigation of why the United States was not able to launch an earth
satellite before the Russians. Such an effort was in progress since 1955.
The basic details of the American satellite effort are worth noting because
they appeared to have a direct bearing on the competition for control of
the space program.

In the early fifties, a group of prominent American scientists proposed
to launch an earth satellite as a means of obtaining more public support
for scientific research. The satellite project, later named Project
Vanguard, was to be launched during the International Geophysical Year,
an eighteen month period of world-wide scientific activity beginning in
July, 1957. The proposed earth satellite project required substantial
government support in terms of funds, a booster rocket, instrumentation,
tracking facilities and so forth. The expertise and hardware for such
a venture was lodged in the Department of Defense, and the IGY group
needed the cooperation of DOD, or develop the technology and hardware themselves.
The latter course of action would have exponentially increased the cost
of the project, and probably delay a successful launch well beyond the
International Geophysical Year.

The IGY Project received substantial support from the scientific
community. The argument which won Presidential support for the proposal
was a simple one--in an era of pronounced international tensions, the first

venture into space should emphasize peaceful scientific investigation
rather than military research and development activities. However, the
Department of Defense was not enthusiastic about participating in the
project. DOD was eventually agreed to support the project, but their support
was contingent on the grounds that the IGY project would not preclude
launching military satellites, or interfere with the development of
ballistic missiles. Responsibility for the management of Project Vanguard
was assigned to the Navel Research Laboratory.

The conditions under which the Department of Defense agreed to
participate in the IGY project and the definition of the project by the
civilian participants all seemed to enlarge the probability that the Russians
would be the first to launch an earth satellite. First, DOD was not
willing to allow the IGY project to interfere with urgent work on ballistic
missiles. What this really meant was that DOD would not assign its most
experienced rocket experts to work on the IGY project. (At the time,
Wernher Von Braun and his German colleagues were considered to be the
most prominent rocket experts in the United States. They were "liberated"
by allied occupations forces shortly before the close of World War II.
Von Braun was Director of the Operations Division of the Army Ballistic
Missile Agency.) Hence, the IGY project did not obtain the most experienced
team of rocket experts in the nation. Second, the booster assigned to
Project Vanguard was based on the Navy's Viking/Aerobee-Hi launch vehicle
technology. The Navy's launch vehicle was considerably less advanced
than the Redstone technology which Von Braun and his colleagues had
developed. Third, the Department of Defense maintained a rigorous separation
between Project Vanguard and other closely related efforts. For instance,

DOD was so intent on maintaining the civilian emphasis on America's first exploration of space that the Secretary of Defense requested a formal assurance from Von Braun that a test firing of the Redstone would not orbit its payload. In fact, Von Braun added boiler plate to the Redstone in order to prevent it from going into orbit. These events transpired a year before the Russians launched Sputnik I. (There is speculation that high officials in the government did not want credit for America's first venture into space to be showered on a team of captured, German rocket scientists.) Fourth, the IGY satellite committee of the National Academy of Science did not conceptualize Project Vanguard in terms of a race with the Russians, and even if they had viewed Vanguard in these terms, the evidence indicates that they would have been powerless to accelerate the pace of the project. Finally, the Department of Defense was forced to reverse what it had done so much to prevent--allow Von Braun, a German prisoner of war, to launch an earth satellite on top of a Redstone rocket which Von Braun had set aside for just such a contingency. Von Braun accomplished a successful launch just eighty-four days after the first Sputnik delivered its fateful payload in orbit around the earth.

While the above provides only the barest details of the story of Project Vanguard, it does provide a minimal historical perspective for understanding the struggle for control of the space program and the consequences of the outcome of that struggle for the new space agency. Certainly the Department of Defense was in certain ways responsible for the Sputnik debacle in so far as they failed to foresee the consequences of what would happen if the Soviet Union were the first nation to orbit an earth satellite. In fact, the President and the National Security Council were

apprised of the enormous propaganda advantage that would accrue to the first
nation to successfully launch an earth satellite. (In 1955, Nelson
Rockefeller then a Special Assistant to the President, wrote a covering
memo to the Vanguard proposal warning of the possible loss of national
prestige if Russians plans to launch an earth satellite came to fruition
first. The National Security Council approved the proposal without recommend-
ing a national priority designation fro Project Vanguard.) On the other
hand, the Department of Defense could claim credit for rescuing the
nation from a national crisis.

The ambiguous record of the Department of Defense in the Vanguard
affair could be viewed either positively or negatively depending on one's
general assessment of the Departme t of Defense. Friends of DOD inside and
outside the government mounted an impressive campaign to obtain military
control or substantial military involvement in future space efforts. However,
the Department of Defense was not the only Federal agency interested in
space exploration. Both the National Advisory Committee on Aeronautics
and the Atomic Energy Commission began a campaign to obtain a role in space.

It was well known that the President was distressed about the Sputnik
clamor. He did not want to commit the nation to an expensive space
program with low scientific yield, nor did he want to accelerate tensions
between the United States and the Soviet Union by creating a program which
emphasized the military aspects of space. Politically, Eisenhower had to
create a program which would: 1) be somewhat spectacular to satisfy the
general public; 2) be sufficiently scientific to satisfy the scientific
community; 3) protect the national security by assuring DOD that a civilian
space program would not preclude military activities in space necessary to

protect the national security.

Eisenhower's decision to create a national space program under the
aegis of the National Advisory Committee for Aeronautics appeared to be
the only alternative which would assure a satisfactory compromise of all
the various issues and groups involved in the Sputnik controversy. NACA
was a civilian research and development agency which commanded the respect
of the scientific community, had excellent relations with the Department
of Defense and was on good terms with Congress. Furthermore, the younger
men in NACA were eager to expand their research and development activities
in the space field. On the whole, Eisenhower's decision seemed to assuage
a variety of strong internal and external political pressures in any which
did not greatly antagonize any one group, or ignore any specific vital
issue.

However, while Eisenhower quieted the political controversy about
Sputnik, his decision to give the space program to NACA had long range
consequences for the new space agency. First, the fact that no single
group was completely satisfied with the President's decision meant that
NASA had a diverse clientele no one of which was capable vis-a-vis the
others of providing long range support for a civilian space program.
This in turn meant that NASA programs had to satisfy competing interests--
scientific and military, as well as provide spectacular achievements to the
public in order to survive the appropriation process. In short, NASA did
not have a clientele which held shared understandings about the objectives
of the organization, and consequently became greatly dependent on Russian
achievements in space for program direction and congressional funding.
To this day, NASA has not been able to solve this most fundamental problem.

The second major consequence of Eisenhower's decision to give the space program to NACA had to do with the fact that NACA was an aeronautical research and development agency which had a long tradition of weak top management and strong, semi-autonomous program areas and field centers. The first administrator of NASA, T. Keither Glennan, was, therefore, faced with a twofold dilemma--on the one hand, he was the director of an organization whose primary expertise was aeronautical research, and on the other hand he was the director of an organization which had always resisted centralized control.

Glennan apparently correctly diagnosed the situation and decided to improve the astronautical expertise of NASA and moved cautiously in the area of organization by not tampering with the decentralized organization which he inherited. However, this decision in turn had other profound consequences for NASA. In order to build NASA's space capability, Glennan had no choice but to obtain a number of military space projects which were being conducted by the Department of Defense. Glennan was relatively successful in obtaining several small projects, but their acquisition alone could not give the new space agency the kind of hardware and expertise it really needed for manned and unmanned space flight. Glennan needed rockets and rocket experts, both of which were owned by DOD. Unless Glennan could obtain both men and hardware, he would be forced to develop a rocket capability which already existed elsewhere in the Federal Government. Even to attempt to do so would have created a storm of criticism which the fledging space agency could ill afford. Thus, Glennan had little choice but to deal with the Department of Defense.

Glennan did manage to obtain a number of small space projects. However, the real prize was the Army's Ballistic Missile Agency otherwise

known as Von Braun's Saturn Rocket team. That the military was reluctant

to surrender Von Braun to NASA was understandable in the view of the fact

that they owned the nations space expertise, but lost out in obtaining

the space program. Glennan's first attempt to obtain the Von Braun

team was thwarted by strong military opposition. A year later, the

matter was resolved at the highest levels of government.

Springing loose the Von Braun team from DOD was a part of the general

trend. Throughout the Glennan era there was a steady stream of DOD

personnel to NASA. This movement of man from DOD to NASA included people

with skills which ranged from rocket experts to contract officers, and

it is our opinion that these experts brought with them the ideas, skills

and experience which provided the basis for the emergence of project

management and management systems in NASA.

As far as organizational matters were concerned, Glennan's achieve-

ments were far less spectacular. After the 24 months of service, Glennan's

NASA dramatically resembled Dryden's NACA. The only exception was the fact

that Glennan succeeded against a good deal of opposition in creating a

general manager known as the Associate Administrator. This created four

levels of management, Administrator & Deputy Administrator, Office of

Associate Administrator, heads of technical programs and staff services

and lab directors as opposed to three levels of management which character-

ized NACA.

The organization which Webb inherited from Glennan was not necessar-

ily suited for the formidable task of a lunar expedition. While Glennan

succeeded in creating a space capability for NASA, a vital requirement

for a space agency, he also allowed NASA's overall organization to

develop along the lines of NACA, a bureau agency in which power was located
in the third and fourth levels of management. What this in turn meant
was that NASA consisted of programs run by men whose interests did not
extend beyond their program areas. This situation was in part a legacy
of NACA, i.e., Glennan could not improve the astronautical capability of
NASA and at the same time centralize management power without stimulating
massive organizational resistance. Finally, the absence of a White House
commitment for programs beyond Project Mercury made it less necessary
for Glennan to centralize management power. Had such a commitment be
given from the White House, Glennan could have reorganized NASA on the
grounds that the agency's mission required organizational integration,
and that such integration could only be achieved through strengthening
top management.

Of course, NASA's second administrator, James Webb, did get what
Glennan never received, i.e., a firm White House commitment to place a
man on the moon before 1970. Webb was assured of the necessary funds
and could obtain the men and hardware to accomplish the mission. However,
he did not have the organization necessary to accomplish a lunar landing
before 1970.

In many ways, Webb's problems were far more complicated than the
ones which Glennan faced. Webb had to put a man on the moon with an
organization which consisted of a number of parochial estates. While
it was clear that NASA had to organize around Apollo, considerable contro-
versy arose regarding the scope and control of the Apollo program.
Some argued, principally the Director of Manned Spaceflight, that NASA
would have to allow Apollo to become a semi-autonomous organization

within NASA. Opponents, Webb and NASA's management experts, argued that
a semi-autonomous Apollo program would only exacerbate the conflicts
between competing programs. Furthermore, organizing NASA around Apollo
meant that NASA would gamble the entire space agency on one program.
Should congressional and White House support waiver, NASA could be
dealt a mortal blow.

In the end, Webb decided that NASA needed an organizational structure
which would integrate the organization in order to achieve the Apollo
mission; and at the same time allow NASA to engage in other research and
development activities. From his point of view, the only means to accom-
plish this objective was to centralize management power at the top.
This approach would protect non-Apollo research and development activities,
and at the same time top management would assure manned spaceflight
the men and dollars necessary to achieve a lunar landing. In essence,
this was the rationale for the 1961 organization.

There were a number of specific organizational forms which could have
been employed to achieve top management control. The one Webb chose
was quite dramatic. Directors of field centers would no longer report
to the directors of headquarters technical offices, but they would report
directly to the Associate Administrator. The Directors of field centers
were thereby elevated to an organizational level equal to headquarters
program directors. Thus, both headquarters program and field centers
directors were organizationally exposed to both top management's point
of view and control.

However, one feature of the 1961 reorganization apparently created a
conflicting situation. Field center directors received men and dollars

from the Associate Administrator and management instructions and program

direction from headquarters program directors. Since field centers

invariably conducted multiple activities, center directors were receiving

orders from various headquarters program directors, but they were not

able to obtain enough men and dollars from the Associate Administrator

to fulfill the demands placed on them. Part of this confusion may have

been due to the fact that during this period NASA was expanding rapidly

in terms of men and money. Another factor which might have contributed

to the situation at Headquarters was the fact that the Associate Adminis-

trator did not have the staff necessary to manage his new responsibilities.

Finally, one might hypothesize that headquarters program directors were

deliberately overloading the field centers in an attempt to retrieve the

power they lost in the reorganization.

The first indication that the November, 1961, reorganization was

not working became evident when the director of manned space flight

won back control of the field centers relevant to manned space flight.

This change was doubtless inevitable given the priority of manned space

flight in NASA's overall program. What probably happened was that other

NASA programs were absorbing center resources which manned space flight

people felt they could not afford. One means of resolving this dilemma

was to invest the headquarters manned spaceflight program office with

control of its field installations.

Given the retrenchment in manned spaceflight, it was only natural

that other headquarters program directors would attempt to regain control

of their field centers. At this point, the program directors could argue

that the integrity of all non-manned research and development activities

was threatened unless the appropriate headquarters program directors had the power to control their field installations. While sources presently available are not clear about what was precisely involved, in 1963, Webb did decide to change back to conditions that prevailed before the 1961 reorganization.

The 1963 reorganization was only a temporary retrenchment. Top management did make its point. Furthermore, top management did give back all that it took away. Finally, top management was greatly strengthened through the development of staff support in the offices of the Associate Administrator, the Deputy Administrator and the Administrator.

There were three major changes in the NASA organizational structure instituted in 1965. The first change involved additional duties and authority delegated to the Deputy Administrator, Dr. Seamans. In effect he was the final authority on most matters. The second change related to expanding the scope of authority of the Associate Administrators in charge of the Program Offices at headquarters, just one level below that of Deputy Administrator. They were given additional duties, primarily delegated to them by the Deputy Administrator, which involved becoming part of the general management structure concerned with agency wide responsibilities. In effect they were to be considered as assistant general managers under Seamans. The third change involved creating a functional staff office organization which reported directly to the general manager and his assistants. This functional staff organization was charged with the responsibility of insuring NASA wide coordination and consistency. As well, a major feedback mechanism to provide maximum information flows from lower to upper levels of the organization was instituted as part of the responsibility of the secretariat.

All the changes primarily involved the headquarters component of NASA and were oriented toward making the Deputy Administrator and the Associate Administrators for Programs, the central focus of decision making and authority in the agency. This reorganization beyond strengthening the control position of headquarters, also represented an attempt to further balance the agency by emphasizing the enduring NASA organization. That is, by virtue of systematizing the functional staff office activities and relating them to the geneeal manager in a formal way, the probability of maintaining the agency as a more permanent entity was enhanced. The general manager was made more aware of the total agency requirements and was also able to more accurately assess the consequences of decisions insofar as they had relevance for the agency as a whole.

The effect this had on the field centers' activities of the Apollo Program is difficult to deal with at this time. One can hazard the guess that the programatic organization was further constrained by the device of strengthening the functional staff offices. It is likely that the Apollo Program requirements were filtered through yet another administrator network and hence at least partially impeded. It is important to remember that by 1965, the Apollo program had just about reached the zenith of activity and complexity. Therefore, the administrative drive to routinize and standardize the already established patterns of activity became more apparent. Further, in succeeding years the manned space flight effort would decrease in importance, and one must assume that top management was aware of this. Thus, procedures were needed to make the anticipated decrease in organizational activity a smooth and non-problematical accomodative process.

The year 1967 in NASA was marked by the continued thrust of greater organizational control being located at the top of the organization and the further implementation of administrative procedures. The need for greater control and predictability was made apparent by the Apollo 204 fire and by ever decreasing activity in the Apollo program. The latter made more salient the dilemma of keeping the organization viable after the successful conclusion of the then operating space effort.

The changes that were instituted in 1967 occured over a period of time and they were all related by a common theme. The aim of the changes was to make the organization more flexible, in terms of being able to respond to subsequent operating contingencies, whether expansive or contractive in nature, and at the same time to further formalize the organization by accenting administrative control procedures. While the Apollo 204 fire was, of course, an unforeseen occurrence, it did serve as a catalytic agent to accelerate the pace of changes either established or planned.

The first change, directly a result of the accident at Kennedy, was to set in motion a network of self-policing activities designed to make more visible all elements of the organizational structure and thereby increase managerial control. As well, a system was established to facilitate the anticipatory or preventative functions of senior personnel. In essence this meant that an additional set of administrative controls were being utilized to further constrain programatic activities. Remember that just about all of NASA's activities are public and that the agency depends on the vagaries of the Congress and other constituent support it can generate itself. Thus, it must be constantly concerned with the self-policing function. It is my belief the changes established as a reaction to the fire should be interpreted at least partly from this perspective.

The second change involved the creation of the office of Organization and Management under the direction of Harry Finger. This office was charged with the responsibility for developing guidelines by which research and development personnel who possess administrative capabilities could more easily be identified and selected to fill senior level positions. It was also to recommend transfers of those personnel identified as having mainly scientific or engineering skills into appropriate positions. Lastly, it was given responsibility for creating administrative procedures, and seeing that they were executed by senior NASA officials, to make even more visible the chain of decision making and management within the agency so that further control procedures could be established. Thus, the Office of Organization and Management operated to facilitate the continuing rationalization process in the sense of creating greater administrative constraints on activities being carried out at the centers and as well in creating evaluation procedures which would allow the organization to take maximum advantage of the skills which people in the organization possessed. While there is no verification for this interpretation at present, we further believe that the Office of Organization and Management constitutes the initial step in the creation of administrative procedures which culminated in the issuance of a Management Instruction by Webb, the Project Approval Document, designed to almost totally standardize the daily operating procedures of the agency.

The PAD's as they are called are the basic mechanisms for authorizing and controlling programs and resources in NASA. They are utilized to define the technical scope of work, to allocate the agency wide resources for support to work being carried out, and to comprehensively define the

character of activities both within NASA and in its dealings with entities

in its environment. Keyed to the PAD's are procedures for appending

additional feedback mechanisms and management techniques as they are needed.

In effect, the PAD's totally isolate and make visible each activity in

NASA, by detailing the scope of the work and how it should be managed.

As well, they describe how, and in what ways, it is related to other

ongoing activities both within and without NASA. To our mind this rep-

resents the final step in consolidating the control mechanism in NASA

and insuring that activities can be managed from the top of the organization.

It should be noted that Dr. Seamans left the agency in 1967 and this

undoubtedly contributed to the need for greater routinization.

The position of Associate Administrator was revised when Seamans

left and under Newell, who was elevated to that position, was given

responsibility for building a planning operation to cope with the dilemma

of what was going to follow after Apollo. The planning group included

senior Headquarters and Center people who collectively were responsible

for developing programs and resource data for in-NASA planning activities

and as well for gathering and generating the information necessary for

the agency's annual submissions to the Bureau of the Budget. This

step represents the formalization of a procedure by which NASA can more

adequately develop anticipatory mechanisms to cope with contingencies

after Apollo. Traditionally, this is thought to be one of the character-

istics of mature, enduring organizations.

During and after 1967, there were other organizational changes, all

of which appear to be logically related to the routinization process.

Two of the more significant changes involved instituting a tightly controlled

authority delegation procedure and organizing and systematizing the

NASA environmental relationships. We could go on and list other modifications in the organization but the point has been made. At this time, it appears that at the least those NASA changes instituted in 1965 and after resulted in strengthening the top management component in NASA and thereby emphasized enduring organizational concerns at the expense of the Apollo program. Perhaps it would be more accurate to say that the life history of the Apollo program and its changing configured relationship can be dichotomized. The first half of the Apollo Program emphasized the program, in the latter half, the NASA organization gained in prominence. Even this crude characteristic makes clear one central point. The Apollo program organization, including the Project Manager concept, can only be understood by viewing the continuously changing pattern of relationships within the total Apollo program and the articulation of the Apollo program with the larger NASA organization.

The project manager concept as utilized in the Apollo program is one of what I believe to be two generic types of project management. The first type, used by the Apollo program involves a project construction within an existing organization. There is, in this type, an inherent conflict between programatic requirements and organizational requirements. In the long run, the organizational requirements take precedence. This was the case in NASA. What made the emergence of organization dominance so problematical was the attempt to initially make the programatic aspect dominant. This in itself would constitute an interesting study, for you have the creation of a permanent agency having to cope with a situation where it derives a majority of its identity by virtue of its being a impermanent agency. In other words, among other things, there was an inherent instability which constituted one characteristic of its very nature.

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The second type of Project Management is characterized by the lack
of an organizational context. That is, there is a project and it has
to generate the needed services and resources as well as accomplish the
work it was created to do. Here, obviously , all of the control is located
in the project. The basic dilemma this type of project orientation
has to deal with is establishing the basis by which it can insure the
continuous flow of needed resources to accomplish its mission. One
would suspect that this is a less efficient form of project management
because it must be concereed with both maintenance and programatic
activities. It is apparent that there are limitations to either form
of project management. One type finds its programatic activities
constrained by the requirements of the organization which it is a part.
The other finds it must be concerned with ortanizational surrogates to
insure the needed services by which to accomplish its programmatic activ-
ities.

By way of concluding this report let me comment on the general
strategy that we are attempting to follow and the implications of that
strategy for the interdisciplinary nature of our work. Our initial
work has involved familiarizing ourselves with the general history of
the NASA organization. This has led us to the organizing hypothesis
concerning the internecine conflict between Apollo program activities
and enduring organizational requirements in NASA. The initial reasoning
for our focus has been presented and as well, we have tried to outline
what changes were instituted to reduce the level of conflict, concen-
trating on the NASA headquarters component. The next step involves
thoroughly documentary the charge process in NASA headquarters and
either substantially or modifying our organizing conceptual scheme.

Once this is accomplished the three development field centers will have
to be studied to document the effects of the changes and as well to
better understand the dimensions of the conflict and their probable
differing emphasis in the three centers. Finally to gain a total
perspsective, the contracting process will have to be investigated.

The major "interface" we would appear to have wtth the "working
group" would appear to be at the level of field center-headquarter inter-
action and in particular our perspective of field center organization
both affecting and being affected by the series of large NASA wide
perturbations that have occurred. Since one of our major assumptions
is that the project manager can only be understood in terms of his rela-
tionship to the larger NASA organization we hope to provide the necessary
larger background contexts for our combined effort.